

SMALL EXPLORER (SMEX) ANNOUNCEMENT OF OPPORTUNITY

SPACE SHUTTLE LAUNCH OPPORTUNITIES

Shuttle Use and Projected Opportunities

A SMEX or Mission of Opportunity payload may be launched as a secondary payload of opportunity on the Space Shuttle. Except for flights to the International Space Station (ISS), opportunities on the Shuttle are expected to be limited through 2004.

Capabilities and Requirements

The Space Shuttle offers unique opportunities to launch payloads that are large, heavy and/or require recovery. It can also carry small payloads on a space-available basis. Since secondary payloads share the mission with other payloads, the resources and capabilities of the Space Shuttle are shared among all payloads on a mission. Experiments can be conducted on a free flyer. Free flyers can be either dedicated satellites or carriers, to which the instrument mounts, which, in turn, interface with the Orbiter. The capabilities and resources available to the experimenter are the combination of the instrument/carrier design and the portion of Shuttle resources allocated to that payload.

Payload Size

While the capacity of the Space Shuttle is in excess of 32000 pounds, secondary payloads generally do not exceed 8000 pounds. Similarly, the shuttle payload bay volume (15' dia. x 60' long) is shared among the entire payload complement. Instrument size, shape, and mass are driven by the capabilities of the carrier within the constraints of the Shuttle and the other manifested payloads.

Orbits

The Shuttle can carry payloads into orbits with an inclination ranging from 28.5 degrees to 57 degrees. Altitudes at which free flyers can be deployed depend on a variety of factors but can vary from 110 nmi to over 300 nmi. Free flyers can carry orbit adjust systems to modify orbit parameters.

Mission Duration

Shuttle launched mission duration varies depending on the mission design. Mission designs can include deployment and retrieval on the same Shuttle mission, deployment on one mission and retrieval by a later mission, or deployment and no retrieval.

Payloads and spacecraft that are deployed and retrieved on the same mission are generally constrained to two weeks or less. Spacecraft not retrieved on the same mission as deployment can remain in space for periods ranging from months to years.

Environment

Launch, orbital, and landing environments are driven by a combination of the Shuttle environment, the presence of other payloads in the bay, and the instrument/carrier design. Specific environments are available from spacecraft and carrier providers.

Payload/Launch Vehicle Integration and Launch

Integration of the payload with the Space Shuttle will be accomplished at the Kennedy Space Center in Florida. The Proposer's launch site integration and testing team will work with the KSC ground operations team during the integration of the flight payload, and its ground systems, with the Shuttle and its associated GSE.

Shuttle Safety

When the proposed mission is a Shuttle payload the proposer is required to plan and implement a system safety program that meets all Space Shuttle safety requirements imposed by the Johnson Space Center for NSTS payloads. The controlling safety documents are (NHB) 1700.7, Safety Policy and Requirements for Payloads Using the Space Transportation System; and (KHB) 1700.7, "STS Payload Ground Safety Handbook". The Space Shuttle Program typically requires 3 safety reviews. Proposers are advised that Space Shuttle safety requirements are particularly strict and may lead to unexpected design changes, additional test or analysis requirements, and associated cost increases. These can be mitigated significantly by early involvement with the Shuttle Safety Office, however, higher contingency levels are recommended for Shuttle based missions.

Cost

For this AO, the basic Shuttle launch service cost is not charged to the proposal. Mission uniques and Shuttle integration costs are charged to the proposal. See section 4 of the SMEX AO.

Points of Contact

Proposers considering NASA Shuttle free flying carriers should contact the Suborbital Projects and Operations Directorate, Mail Code 800.G, NASA Goddard Space Flight Center, Greenbelt, MD 20771; contact David J. Shrewsberry (301) 286-8813, E-mail address:

David.J.Shrewsberry.1@gsfc.nasa.gov for additional information and guidance.

For dedicated satellites, proposers should contact the Space Operations Utilization Office, Code MO, NASA Headquarters, Washington, DC, 20546-0001; contact Robert L. Elsbernd (202-358-4417), E-mail address robert.elsbernd@hq.nasa.gov. Mr. Elsbernd is also the point of contact for Shuttle manifesting opportunities.

For specific technical inquiries regarding the Shuttle, and to discuss mission unique requirements and integration costs, contact the Space Shuttle Customer and Flight Integration Office, Code MT, NASA Johnson Space Flight Center, Houston, Texas, 77058-3696; contact Richard M. Swalin (281-483-1145), E-mail address: richard.m.swalin@jsc.nasa.gov.